

WHAT IS CLAIMED IS:

1                   1. A virtual backplane for an information network interconnecting  
2 a plurality of computer elements comprising:  
3                   a plurality of physical backplanes, each backplane interconnecting a  
4 plurality of cards, at least one card in each backplane interfacing at least one  
5 computer element;  
6                   a data interconnect comprising at least one group, at least one card in  
7 each backplane connected to at least one group;  
8                   at least one management processor supplying routing information to  
9 the plurality of cards; and  
10                  a network interconnecting the at least one management processor and  
11 the plurality of cards.

1                   2. A virtual backplane as in claim 1 wherein at least one card  
2 comprises a plurality of communication ports.

1                   3. A virtual backplane as in claim 1 wherein the data interconnect  
2 comprises at least one fiber channel.

1                   4. A virtual backplane as in claim 1 wherein the data interconnect  
2 comprises at least one ATM switch.

1                   5. A virtual backplane as in claim 1 wherein the data interconnect  
2 comprises Gigabit Ethernet.

1                   6. A virtual backplane as in claim 1 wherein the management  
2 processor provides at least one routing table to each card, each card routing  
3 information to another card based on the routing table.

1                   7. A virtual backplane as in claim 1 wherein the management  
2 processor assigns a unique segment address to each backplane and to each group.

1                   8.     A virtual backplane as in claim 7 wherein each card generates  
2     at least one unique address based on a card number and the segment address of the  
3     backplane containing the card.

1                   9.     A virtual backplane as in claim 1 wherein the management  
2     processor automatically discovers to which cards each card is connected.

1                   10.    A virtual backplane as in claim 9 wherein the management  
2     processor constructs a routing table for each card and sends the constructed routing  
3     table to the card through the network.

1                   11.    A virtual backplane as in claim 1 wherein a routing path is  
2     formed between a requesting computer element and a responding computer element  
3     through a plurality of cards.

1                   12.    A virtual backplane as in claim 11 wherein each card maintains  
2     at least one table of virtual connections, each entry in the virtual connection table  
3     indicating a connection with another card.

1                   13.    A virtual backplane as in claim 1 wherein the cards form a  
2     plurality of multipoint routing paths between a requesting computer element and a  
3     plurality of responding computer elements.

1                   14.    A virtual backplane as in claim 13 wherein each multipoint  
2     routing path between the requesting computer element and one responding computer  
3     element is through a plurality of cards, each card in more than one multipoint routing  
4     path at a point having the next card for at least one path different than the next card  
5     of another path duplicating routed information for the at least one path.

1                   15.    A virtual backplane for an information network interconnecting  
2     a plurality of computer elements comprising:

3 a plurality of physical backplanes, each backplane interconnecting a  
4 plurality of cards, at least one card in each backplane interfacing at least one  
5 computer element;

6 a data interconnect interconnecting at least one card in each backplane;  
7 at least one management processor in communication with each data  
8 card, the at least one management processor operative to

- 9 (a) generate a segment number for each backplane, the segment  
10 number permitting each card to generate a unique address,  
11 (b) send to each card the segment number of the backplane  
12 holding the card,  
13 (c) automatically generate a routing table for each card, the  
14 routing table specifying at least one card to which information  
15 is forwarded on route to any other card, and  
16 (d) send the routing table to each card.

1 16. A virtual backplane as in claim 15 wherein each card runs at  
2 least one application for each computer element connected to the card, each  
3 application assigned at least one address based on the card unique address, the  
4 management processor further operative to forward the at least one address to at least  
5 one additional card.

1 17. A virtual backplane as in claim 15 wherein the management  
2 processor communicates with each data card through a communication network  
3 separate from the data interconnect.

1 18. A virtual backplane as in claim 15 further comprising at least  
2 one group of cards interconnected by the data interconnect, the management processor  
3 further operative to generate a segment number for each group.

1 ~~19~~ A method of communicating between cards, each card  
2 associated with one of a plurality of backplanes, the method comprising:

3 interconnecting each backplane to at least one other backplane through  
4 a data interconnect, each set of cards interconnected by the data interconnect forming  
5 a group;  
6 generating a unique segment address for each backplane and each  
7 group; and  
8 determining a routing table for each card based on at least one segment  
9 to which the card is associated, each routing table specifying at least one next card  
10 to route information for every other destination card.

1 20. A method of communicating between cards as in claim 19  
2 wherein an address for each card is determined based on the segment address for the  
3 backplane with which the card is associated.

1 21. A method of communicating between cards as in claim 19  
2 wherein determining the routing table comprises:  
3 determining the routing table for each card at a management processor  
4 in communication with the card; and  
5 distributing the routing table from the management processor to the  
6 card.

1 ~~22.~~ A method of communicating between cards, each card  
2 associated with a backplane, at least one card in each backplane connected to a data  
3 interconnect, the method comprising:  
4 determining, in a management processor, a routing table for each  
5 card, the routing table specifying to which card information is to be routed for each  
6 destination card, the routing table determined based on the backplane to which each  
7 card is associated;  
8 distributing each card routing table to the card through a  
9 communication network connecting each card with the management processor; and  
10 routing information received by each card based on the card routing  
11 table.

1           25.    A method of communicating between cards as in claim 22  
2    wherein routing comprises point-to-multipoint information transfer.